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EXAMINER	
HAVAN, HUNG T	

ART UNIT	PAPER NUMBER
2128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,409	URANO, YASUNORI	
	Examiner	Art Unit	
	HUNG HAVAN	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/06/2010 has been entered.

Status of Claims

2. In the amendments filed 10/06/2010, the following occurred: Claims 1, 4, and 7 were amended. Claims 1-7 are currently pending in Instant Application.

Response to Amendments

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims **1-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Kawai et al(US Pat. No. 5,313,395)(hereinafter as Kawai)*** in view of ***Santori et al (US Pat. No. 7,076,411 B2)(hereinafter as Santori)***, and further in view of ***Mizushina et al (US Pat. No. 4,984,988)***.

Kawai discloses: As per **Claim 1**. (Currently Amended) An engine transition test instrument comprising:

a virtual engine tester for simulating a transition state of a virtual engine in which a rotational speed or torque of the virtual engine changes with time **(col. 6, lines 46-57, fig. 3 and fig. 4, teaches rotating speed is measured and modeled)**; and

an actual engine transition tester for conducting actual transition testing using an actual engine **(col. 3, lines 65 to col. 4, line 5 and fig. 1, teaches a rotating speed adjusting means to adjust the engine speed of the internal combustion engine and a control means which calculates a control value.)**; and

an actual controller for controlling the actual engine **(col. 3, lines 65 to col. 4, line 5 and fig. 1, teaches a rotating speed adjusting means to adjust the engine speed of the internal combustion engine and a control means which calculates a control value.)**,

wherein the virtual engine tester comprises:

a simulator for simulating the behavior of the virtual engine by creating a transition engine model based on data obtained by driving the actual engine while changing a value of at least one controlled factor **(col. 5, lines 46-59 and col. 6, lines 35-42 and lines 46-59, teaches an autoregressive moving average model is utilized for the model of a system which controls the idling speed of the**

engine. The constants for the model are determined experimentally by means of a step response. It would have been obvious to one of ordinary skill in the art to drive an engine to gather experimental data for better accuracy.);

a virtual controller that emulates the actual controller and supplies an engine control signal to the tester simulator**(col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35, teaches a control means)**, and

the actual engine transition tester comprises a means for switching to the engine control signal output from the virtual controller **(i.e. dynamic model)** from a corresponding portion of the engine control signals output from the actual controller for controlling the actual engine, and supplying a switched signal to the actual engine **(col. 3, lines 26-37, col. 21, lines 60-63 and col. 23, lines 57-62, teaches a dynamic model to control the idling speed of an internal combustion engine.)**.

Kawai does not expressly disclose a simulator for simulating behavior of an engine.

Santori, however, discloses a simulator for simulating behavior of an engine **(col.4 47-52, 58-63 and fig. 2A, teaches simulation of automobile coupled to control unit)**.

Kawai and Santori are analogous art because they are from similar problem solving area of designing control unit. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-loop simulation as discussed by Santori to test the unit to control idling speed of an engine for purpose of testing response of a control unit **(Santori: col. 58-64)**.

Although Kawai and Santori disclose a controller, they do not expressly disclose the controller having a predetermined control map to output engine control signals and the engine control signals output from the control map of the controller.

Mizushina, however, teaches a controller having a predetermined control map to output engine control signals **(Fig. 2, item 11, col. 3, lines 11-31, teaches simulated engine characteristic control system comprising … an engine characteristic generator for generating a torque command signal according to predetermined engine revolution/torque characteristic curves)** and engine control signals output from the control map of the controller **(col. 3, lines 32-45, teaches simulation control system includes means for transducing the torque command signal to an electric current command signal according to a predetermined torque/current characteristic curve. See also Fig. 2 and col. 4, lines 37-58, teaches current I_1 output from transducer 11.)**.

Kawai, Santori, and Mizushina are analogous art because they are from similar problem solving area of designing control unit. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-loop simulation as discussed by Santori to test the unit to control idling speed of an engine as discussed by Kawai in combination with a transducer with predetermined characteristics as discussed by Mizushina for purpose of testing response of a control unit **(Santori: col. 58-64)**.

Santori discloses: As per **Claim 2**. (Previously Presented) The engine transition test instrument according to claim 1, wherein the virtual engine tester further comprises a control value operation means for supplying a control value for a controlled factor to the virtual controller **(see**

fig. 10, item 427 and 429, col. 5, lines 17-26, col. 21, lines 61-67, target device may execute control algorithm to control physical system), to cause simulation results by the simulator to be displayed on display means **(see fig. 5, items 310, 312, and 314, col. 17, lines 52-59, teaches a GUI to control a hardware-in-the-loop simulation)**.

Kawai discloses: As per **Claim 3**. (Previously Presented) The engine transition test instrument according to claim 1, wherein the actual controller is configured so as to perform feed back control with referencing the output value of the actual engine **(col. 3, line 60 to col. 4, line 5 and fig. 1, teaches adjusting rotating speed of internal combustion engine using a feedback loop)** and the instrument comprises a means for correcting the output value from the actual engine that has changed when the engine control signal output from the virtual controller was supplied to the actual engine to a value before such a change was made, and feeding back the corrected value to the actual controller **(col. 4, lines 5-26, teaches control means is provided with first control value setting means which sets a state variable according to detected rotating speed by previous operation timing. A selecting means is disclosed to select the desired first control value or second control value)**.

Kawai discloses: As per **Claim 4**. (Currently Amended) An engine transition test method comprising:

a first step of creating a transition engine model based on data obtained by driving an actual engine while changing a value of at least one controlled factor in a transition state in which an engine rotational speed or torque changes with time **(col. 5, lines 46-59**

and col. 6, lines 35-42 and lines 46-59, teaches an autoregressive moving average model is utilized for the model of a system which controls the idling speed of the engine. The constants for the model are determined experimentally by means of a step response. It would have been obvious to one of ordinary skill in the art to drive an engine to gather experimental data for better accuracy.);

a second step of emulating an actual controller controlling the actual engine, generating an engine control signal based on a control value set for the at least one controlled factor **(col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35, teaches a control means)**; and

a third step of switching to the engine control signal generated in the second step from a corresponding portion of the engine control signals output from the actual controller, and supplying the switched signal to the actual engine **(col. 3, lines 26-37, col. 21, lines 60-63 and col. 23, lines 57-62, teaches a dynamic model to control the idling speed of an internal combustion engine.)**.

Kawai does not expressly disclose operating the transition engine model as a virtual engine. Santori, however, discloses operating the transition engine model as a virtual engine **(col.4 47-52, 58-63 and fig. 2A, teaches simulation of automobile coupled to control unit)**.

Kawai and Santori are analogous art because they are from similar problem solving area of designing control unit. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-loop simulation as discussed by Santori to test the unit to control idling speed of an engine for purpose of testing response of a control unit **(Santori: col. 58-64)**.

Although Kawai and Santori disclose a controller, they do not expressly disclose the controller having a predetermined control map to output engine control signals and the engine control signals output from the controller.

Mizushina, however, teaches a controller having a predetermined control map to output engine control signals **(Fig. 2, item 11, col. 3, lines 11-31, teaches simulated engine characteristic control system comprising … an engine characteristic generator for generating a torque command signal according to predetermined engine revolution/torque characteristic curves)** and engine control signals output from the controller **(col. 3, lines 32-45, teaches simulation control system includes means for transducing the torque command signal to an electric current command signal according to a predetermined torque/current characteristic curve. See also Fig. 2 and col. 4, lines 37-58, teaches current I_1 output from transducer 11.)**.

Kawai, Santori, and Mizushina are analogous art because they are from similar problem solving area of designing control unit. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-loop simulation as discussed by Santori to test the unit to control idling speed of an engine as discussed by Kawai in combination with a transducer with predetermined characteristics as discussed by Mizushina for purpose of testing response of a control unit **(Santori: col. 58-64)**.

Kawai discloses: As per **Claim 5**. (Previously Presented) The engine transition test method according to claim 4, wherein the second step is repeated while changing the control value **(col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35 fig. 1, teaches a control means which is in a**

loop that controls an engine. The loop allows the control value to be adjusted according to the state of the engine), and the third step is performed when the output value from the virtual engine satisfies objective performance **(col. 5, lines 39-45)**.

Kawai discloses: As per **Claim 6**. (Previously Presented) The engine transition test method according to claim 4, wherein the output value from the actual engine that has changed when the engine control signal generated in the second step was supplied to the actual engine **(col. 5, lines 39-45)** is corrected to a value before such a change was made, and the corrected value is fed back to the actual controller **(col. 1 61-65, col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35 fig. 1, teaches a control means which is in a loop that controls an engine. The loop allows the control value to be adjusted according to the state of the engine)**.

Kawai discloses: As per **Claim 7**. (Currently Amended) A computer readable medium having instructions for causing an information processing system to perform steps comprising:

creating a transition engine model based on data obtained by driving an actual engine while changing a value of at least one controlled factor in a transition state in which an engine rotation speed or torque changes with time **(col. 5, lines 46-59 and col. 6, lines 35-42 and lines 46-59, teaches an autoregressive moving average model is utilized for the model of a system which controls the idling speed of the engine. The constants for the model are determined experimentally by means of a step response. It would have been obvious to one of ordinary skill in the art to drive an engine to gather experimental data for better accuracy.)**;

emulating an actual controller that controls an actual engine **(col. 6, lines 46-57, fig. 3 and fig. 4, teaches rotating speed is measured and modeled)**;

generating an engine control signal based on a control value set for the at least one controlled factor **(col. 3, lines 66 to col. 4, line 5 and col. 19, lines 30-35, teaches a control means);**

operating the transition engine model as a virtual engine **(col. 6, lines 46-57, fig. 3 and fig. 4, teaches rotating speed is measured and modeled)**; and

switching to the engine control signal generated from a corresponding portion of the engine control signals output from the actual controller, and thereby supplying the switched signal to the actual engine **(col. 3, lines 26-37, col. 21, lines 60-63 and col. 23, lines 57-62, teaches a dynamic model to control the idling speed of an internal combustion engine.)**.

Kawai does not expressly disclose a computer readable medium having instructions for causing an information processing system to perform steps.

Santori, however, discloses a computer readable medium having instructions for causing an information processing system to perform steps **(see fig. 1, computer system. See also col.4 47-52, 58-63 and fig. 2A, teaches simulation of automobile coupled to control unit)**.

Kawai and Santori are analogous art because they are from similar problem solving area of designing control unit. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-loop simulation as discussed by Santori to test the unit to control idling speed of an engine for purpose of testing response of a control unit **(Santori: col. 58-64)**.

Although Kawai and Santori disclose a controller, they do not expressly disclose the controller having a predetermined control map to output engine control signals and the engine control signals output from the control map of the controller.

Mizushina, however, teaches a controller having a predetermined control map to output engine control signals **(Fig. 2, item 11, col. 3, lines 11-31, teaches simulated engine characteristic control system comprising … an engine characteristic generator for generating a torque command signal according to predetermined engine revolution/torque characteristic curves)** and engine control signals output from the control map of the controller **(col. 3, lines 32-45, teaches simulation control system includes means for transducing the torque command signal to an electric current command signal according to a predetermined torque/current characteristic curve. See also Fig. 2 and col. 4, lines 37-58, teaches current I_1 output from transducer 11.)**.

Kawai, Santori, and Mizushina are analogous art because they are from similar problem solving area of designing control unit. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the principles of testing control unit using hardware-in-the-loop simulation as discussed by Santori to test the unit to control idling speed of an engine as discussed by Kawai in combination with a transducer with predetermined characteristics as discussed by Mizushina for purpose of testing response of a control unit **(Santori: col. 58-64)**.

Response to Arguments

4. Applicant's arguments filed 10/06/2010 have been fully considered but they are not persuasive.

4.1 **Applicant Argues:**

Kawai and Santori do not disclose amended feature of switching from signals output from a transition control map of the actual controller to a signal output from the virtual controller.

4.2 **Examiner Response:**

Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. All claims are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Havan whose telephone number is (571) 270-7864. The examiner can normally be reached on Monday thru Friday, 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/H. H./

Examiner, Art Unit 2128

/David Silver/
Primary Examiner, Art Unit 2128